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## Congenital Heart Disease

**CANDIDACY FOR DEVICE CLOSURE OF COMPLEX MUSCULAR VENTRICULAR SEPTAL DEFECTS:  
NOVEL APPLICATION OF RAPID PROTOTYPING AND VIRTUAL 3D MODELS DERIVED FROM CARDIAC CT  
AND MRI**

Poster Contributions

Poster Hall B1

Monday, March 16, 2015, 9:45 a.m.-10:30 a.m.

Session Title: Pediatric Congenital Heart Disease: Interventional

Abstract Category: 11. Congenital Heart Disease: Pediatric

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**Background:** Complex muscular ventricular septal defects (CMVSD) are often difficult to surgically close and managed by device closure. The pre-intervention imaging is crucial in defining the anatomy and aids in patient selection. We hypothesized that 3D physical and virtual models in patients with CMVSD is feasible, would assist in patient selection and aid in the successful device closure.

**Methods:** Virtual and physical 3D models on 3 patients with CMVSD were generated from CT or MRI data, using Mimics, and 3-Matic software. The first patient had history of complicated and unsuccessful prior device closures, with residual shunt. Two physical models, with and without devices in situ were printed (Figure 1A) for this patient. Two virtual models were generated in the other two patients.

**Results:** The location, size, trabeculations, papillary and muscle bundles were clearly visualized in all patients. The two physical models were extensively studied, resulting in successful device closure of the residual VSD. The virtual model on patient 2 identified RV papillary muscles adjacent to the CMVSD (Figure 1B) precluding device closure. The patient 3 model identified muscle bundles crowding the VSD suggesting potential for spontaneous closure.

**Conclusion:** Construction of 3D models in patients with CMVSD is feasible, assists in appropriate patient selection and allows for extensive examination and planning. This may facilitate a focused and informed procedure and improve the potential for successful closure.

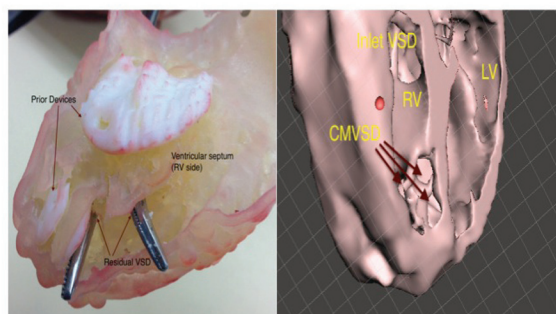


Figure 1A

Figure 1B